Abdominal compartment syndrome (ACS). See also Tissue transfer, abdominal wall defect management
damage control, 59
definition, 9, 59
intraoperative considerations, 180–181
postoperative considerations
medical/minimally invasive therapy, 182
monitoring, 181–182
surgical decompression, 182
therapy, 182
preoperative considerations
defect size, 180
hernia size, 180
patient selection, 179–180
Abdominal pannus, 127. See also Panniculectomy
Abdominal wall
anatomy, 47–48
defects, staged reconstructions
appropriate reconstruction method selection, 87
definitive abdominal wall reconstruction, 86
management options, 88
maturation period, 85–86
temporary abdominal closure, 85
tensor fascia latae flap, 86–87
graft
arterial reconstruction, 148
clinical series, 150
ethical considerations, 150
graft monitoring, 149
graft retrieval, 147–148
immunosuppression/rejection, 149
implantation, 148, 149
incision lines, 148
intraoperative retrieval, 148
skin details, 149
timing, 148–149
venous reconstruction, 149
hernia, 15, 20, 31, 54, 92, 101, 123, 167
physiology
anatomical boundaries, 9–12
decompressive celiotomy, 9
distensibility, 10, 12–13
pneumoperitoneum, 9
surgical implications, 13
Abdominal wall reconstruction. See also Complex abdominal wall defect (CAWD)
ACS (see Abdominal compartment syndrome (ACS))
acute setting
abdomen closing technique, 50
combination closure, 51
open abdomen, 48–49
open packing, 51
retention sutures, 50
skin graft, 52
suture closure, 50
temporary silos, 50–51
towel clip closure, 50
vacuum-assisted wound closure, 51
chronic conditions
comorbidities, 52–53
surgical repair indications, 52
complications, 106
damage control
infection management, 98
nutrition, 98
patient selection, 96
resuscitation, 96–97
temporary abdominal closure techniques, 96
use, 95
ventilation, 97–98
ECFs
algorithm, 145
component separation technique, 139–140
grading system, 54
history
absorbable mesh, 7
Annals of Surgery, 5
laparoscopic repair, 7
nonabsorbable mesh, 6–7
perfect mesh selection, 6
prosthetic materials, 6
The suicide of Cato, 5
IAH (see Intra-abdominal hypertension (IAH))
materials
biologic mesh, 54
synthetic mesh, 53–54
perioperative surgical consideration
indications for and timing of surgery, 173–174
intraoperative considerations, 174–176
operative approach, 174
postoperative care, 176
preoperative preparation, 173
tissue transfer techniques, 176
principles
autogenous reconstruction, 55
in hemorrhagic necrotizing pancreatitis, 55, 56
laparoscopy, 56
mesh placement, 55
minimally invasive techniques, 56
patient optimization, 54–55
tissue expanders, 55–56
tensor fascia latae flap, 86
Abdominal wall transplantation
  abdominal wall graft
    arterial reconstruction, 148
    clinical series, 150
    ethical considerations, 150
    graft monitoring, 149
    graft retrieval, 147–148
    immunosuppression/rejection, 149
    implantation, 148, 149
    incision lines, 148
    intraoperative retrieval, 148
    skin details, 149
    timing, 148–149
    venous reconstruction, 149

rectus muscle fascia
  graft monitoring and immunosuppression, 151
  graft retrieval, 150
  interrupted sutures, multivisceral transplant, 151
  preparation, 151
  results, 152
  storage and implantation, 150
  timing, 150–151

Abscess
  air-fluid presence, 41
  damage control infection management, 98
  enterocutaneous fistulas, 200
  open abdomen complications management, 64–65
  radiologic evaluation, 43

Absorbable synthetic polymers, 92
  ABThera™, 60

Acellular dermal matrix (ADM)
  abdominal wall reconstruction, 102–104, 175
  panniculectomy, 127, 129
  types, 140

ACS. See Abdominal compartment syndrome (ACS)

Adhesiolysis
  ECFs, 137
  perioperative surgical consideration, 174
  skin pinch, 157
  trocar sites, 168

Adhesions, 72–73

Albanese, A.R., 173

American Society of Anesthesiologists (ASA) physical status classification system, 25, 27

 Anastomoses
  damage control, 2
  ECFs, Connell suture technique, 138
  enteric, 66
  fistula resection, 138
  infection, 71
  intestines length, 73
  resection, 65
  short-bowel syndrome, 194
  tensor fascia latae, 86

Antiacid therapy, 190

Appendectomy, 5

Arginine, 201–202

Bridge mesh placement, ECFs
  detailed operative notes, 144
  interposition graft, 143

Butler, C.E., 126, 155

C

Caesar, 5,
Campbell, K.T., 155
Carlson, G.W., 56
Cato, 5,

Complex abdominal wall defect (CAWD)
  biology
    biological and mechanical factors involved, 19–20
    complex recurrent incisional hernias, 18–19
    damage control surgery and open abdomen, 21–22
    wound healing, local and general factors, 20–21
  causes
    abdominal wall infections and recurrent incisional hernias, 16
    abdominal wall tumors resection, 17–18
    damage control, 16–17
    domain loss, 15–17
  definition, 15, 89
  incidence, 89
  prosthetic materials selection
    absorbable synthetic polymers, 92
    biologic prosthetics, 92
    complications, 93
    composites, 92
    considerations, 89–90
    expanded polytetrafluoroethylene, 90–91
    fibrin sealant, hernia repairs, 92–93
    polyester, 90
    polypropylene, 90
    synthetic non-absorbable polymers, 90
  types, 90

reconstruction
  bioprosthetic mesh utilization, 76
  component separation technique, 79–80
  patient selection, 76–77
  postoperative care, 82
  principles, 77–79
  skin management, 80–81
  staged abdominal wall reconstruction, 81–82
  recurrent hernias, 15

Component separation technique
  complex abdominal wall reconstruction, 77–80
  complex tissue transfer, 114–115
  hernia recurrence, 101

minimally invasive
  concept, 154–155
  large abdominal defects, 153–154
  in open abdomen, 161–163
  postoperative care, 161
  preoperative care, 156–157
  recurrence, 164
  vs. results, 156
  step-by-step surgical technique, 158–161
  stomas, 163–164
  surgical technique, 158
  tissue expanders use, 163
  video-assisted, 155–156
  without video-assisted, 155

modifications, 116
perioperative radiologic evaluation, 31, 32, 36–39
Index

Composites, 92
Computed tomography, 32–33
Cooper, C.M., 123
Cothren, C.C., 100
Cumberland, V.H., 6

D
Damage control
- infection management, 98
- intraoperative decision-making process, 2
- nutrition, 98
- patient selection, 96
- resuscitation, 96–97
- surgery (see Tissue transfer, abdominal wall defect management)
- temporary abdominal closure techniques, 96
- use, 95
- ventilation, 97–98
Decision making process. See Intraoperative decision-making process
Deﬁnitive complex open abdominal wall reconstruction, 100–106
de Vries Reilingh, T.S., 115
Difficult abdomen. See Abdominal wall reconstruction
Difficult surgical decisions. See Intraoperative decision-making process
Disastroma, 67, 68
Dixon, A., 5
Dudrick, S.J., 200
Dumanian, G.A., 123, 130, 155

E
Eastern Association for the Surgery of Trauma (EAST), 25–26
ECFs. See Enterocutaneous fistulas (ECFs)
Ennis, L.S., 118
Enteral nutrition (EN), 201. See also Total parenteral nutrition (TPN)
Enteroatmospheric fistulas (EAFs), 16, 52, 53, 65, 69, 70, 187
Enterocutaneous fistulas (ECFs), 27, 65, 67
- GI (see Gastroenterocutaneous fistulas)
- ISOWATS PL strategy, 133
- long-term follow-up, 143–144
- management, 200
- nutritional optimization, 134–135
- operation time/takedown, 135
- postoperative care, 143
- postoperative fistulas identiﬁcation, 133–134
- redeﬁning the anatomy, 135
- sepsis control, 134
- surgical creativity
  - abdominal wall reconstruction, 138–140
  - adhesiolyis, 137
  - anastomoses, 138
  - fistula resection, 138
  - hernia grading system, 141
  - hostile, surgical approach, 136–137
  - interposition/bridge placement, 142–143
  - mesh selection and placement, 140–141
  - onlay placement, 141
  - transthoracic approach, 137
  - underlay placement, 141–142
- surgical management, 144
- wound care, 135
- Expanded polytetraﬂuoroethylene (ePTFE), 90–91

F
Fibrin sealant, hernia repairs, 92–93
Fistula
- city, 53
- ECF (see Enterocutaneous fistulas (ECFs))
- frozen abdomen, 68
- GI (see Gastroenterocutaneous fistulas)
- incidence, 16
- open abdomen complications management, 65–66
- resection, ECFs, 138
Free ﬂap, 6, 80–81, 86, 114, 149, 176
Frozen abdomen. See Hostile abdomen

G
Gastroenterocutaneous fistulas
- classiﬁcation, 199
- EDF management, 200
- enteral nutrition, 201
- epidemiology, 199
- etiology, 199
- immune-modulating nutritional supplementation, 201–202
- pathophysiology, 199
- somatostatin role, 200–201
- TPN, 200
- Glutamine, 193, 201
Gray, S.H., 7

H
Hernia
- abdominal wall, 15, 20, 31, 54, 92, 101, 123, 167
- epigastric midline, 127
- formation, 20
- grading system, 141
- incisional, 5, 15–21, 34, 40, 55, 65, 76, 92, 151, 155, 167, 171
- management options, 88
- massive, 13, 52, 153, 161
- obesity, 21
- open abdomen complications management, 65
- planned ventral, 17, 26, 38, 85, 100, 114, 117, 157, 161
- radiologic evaluation, 31–40
- repair, 56 (see also Mesh; Panniculectomy)
- Rives-Stoppa ventral hernia repair technique, 79
- ventral, 3, 5, 16, 53–55, 90, 102, 113, 161
Hide, I.G., 34
Hobar, P.C., 56
Hostile abdomen
- anastomoses, 73
- close/cover abdomen, 73
- definition, 67, 68
- entering abdominal cavity, 72
- GI tract mobilizing, 72–73
- nutrition support, 71
- operation
  - preparation, 72
  - timing, 72
- patient involvement, 71–72
- preoperative conditions, 67–71
- questions about, 67
- surgical plan creation, 71
Houck, J.P., 125
Huger, W.E., 114

I
IAH. See Intra-abdominal hypertension (IAH)
Incisional hernia, 5, 15–21, 34, 40, 55, 65, 76, 92, 151, 155, 167, 171.
See also Recurrent incisional hernias
Infection management, 98
Intestinal failure. See Short-bowel syndrome (SBS)
Intestinal transplant procedure, 194, 195. See also
Abdominal wall
Intra-abdominal hypertension (IAH)
ACS, 56
damage control resuscitation, 96
intraoperative considerations, 180–181
minimally invasive component separation, 161
normal pressure, 179
postoperative considerations
medical/minimally invasive therapy, 182
monitoring, 181–182
surgical decompression, 182
therapy, 182
preoperative considerations
defect size, 180
hernia size, 180
patient selection, 179–180
wound healing affecting factors, 20
Intraoperative decision-making process
anatomy of surgeon’s decision, 1–2
damage control, 2
resuscitation endpoints, 2
staged operations, 2–3
temporary closure, 3
Ishida, H., 32

J
Jernigan, T.W., 121

K
Kirchhoff, S., 34
Koontz, A.R., 6
Kushimoto, S., 117, 118, 120, 121

L
Laparoscopic techniques, large defects repair
complications and outcome, 171
equipment, 167–168
patient preparation, 167
positioning, 168
postoperative care, 171
prevalence, 167
surgical technique, 168–171
trocar placement, 168
Laparotomy, 59. See also Damage control
Le Blanc, K.A., 7
Luijendijk, R.W., 52

M
Maas, S.M., 116
Malnutrition. See Gastroenterocutaneous fistulas
Massive hernias, 13, 52, 153, 161
Maxhimer, J.B., 108
McDowell, E., 5
Mesh. See also Prosthetic materials selection, CAWD
biologic, 54
bridge
ECFs (see Bridge mesh placement, ECFs)
placement, 55, 141
synthetic, 53–54
Micronutrients, 28, 202
Miller, R.S., 113
Multivisceral transplant. See Abdominal wall

N
Novak, F., 201
Nutrition. See also total parenteral nutrition (TPN)
damage control, 98
preoperative patient optimization, 28
wound healing affecting factors, 21

O
Obesity, 21, 28, 76, 89, 123, 180
Octreotide, 190, 200
Onlay mesh placement, 141
Open abdomen, 48–49. See also Abdominal wall reconstruction;
Tissue transfer, abdominal wall defect management
complications management
abscess, 64–65
fistula, 65–66
hernia, 65
considerations before closure, 60
definitive closure techniques, 62–64
take-back operation, 60
temporary abdominal closure techniques
ABThera®, 60
Bogota bag, 61
considerations, 62
poor-man’s VAC, 60–61
skin-only closure, 62
surgical zipper, 61–62
vacuum-assisted closure, 60
Wittman Patch®, 61, 62

P
Panniculectomy
benefits, 123
clinical anatomy
anterior abdominal wall anatomy, 123–124
anterior rectus sheath and linea alba, 124
skin and subcutaneous fat, 124
superficial fascial system, 123–124
vascularity and innervation, 124–125
clinical example, 127–129
complications management, 130
definition, 124
and hernia repair, 123
operative steps
closure techniques, 127
design patterns, 125–126
perforator sparing technique, 126
skin and fat excision technique, 126
postoperative care, 128, 130
preoperative considerations
prior hernia surgical history, 125
risk factors assessment, 125
types, 123
Pedicled flap, 80–81, 86, 87, 105
Perforator sparing technique, 126–129
Perioperative radiologic evaluation
diagnosis
barium studies with small-bowel follow-through, 33–34
computerized scan, 32–33
magnetic resonance imaging, 34
ultrasonography, 31–32
Index

intraoperative guidance, 40
operative planning guide selection
decision making, 35–36
large defects, 38–39
location identification, 39–40
multiplanar reconstruction use, 34–35
small size defects, 37
ventral hernias, 35
postoperative radiologic assessment, 40–41
recurrence, 41–44
Perioperative risk assessment
cardiovascular system evaluation, 26–27
dermatologic system evaluation, 27–28
gastrointestinal system evaluation, 27
hematologic and coagulation evaluation, 28
infections, 28
neurological system evaluation, 26
nutritional evaluation and optimization, 28
premorbid conditions control, 28
renal system evaluation, 27
respiratory system evaluation, 27
social and addiction issues, 28
Planned ventral hernia, 17, 26, 38, 85, 100, 114, 117, 157, 161
Plastic surgeon’s perspective, CAWD. See Complex abdominal wall defect (CAWD)
Plutarch, 5,
Polyester, 90
Polypropylene, 90
Polytetrafluoroethylene. See Expanded polytetrafluoroethylene (ePTFE)
Pompey, 5,
Poor-man’s VAC (PMV), 60–61
Preoperative patient optimization
clinic evaluation, 26
evaluation, 25
perioperative risk assessment
cardiovascular system evaluation, 26–27
dermatologic system evaluation, 27–28
gastrointestinal system evaluation, 27
hematologic and coagulation evaluation, 28
infections, 28
neurological system evaluation, 26
nutritional evaluation and optimization, 28
premorbid conditions control, 28
renal system evaluation, 27
respiratory system evaluation, 27
social and addiction issues, 28
prevention strategies, 28
timing, surgical repair, 25–26
Prosthetic materials selection, CAWD
absorbable synthetic polymers, 92
biologic prosthetics, 92
complications, 93
composites, 92
considerations, 89–90
expanded polytetrafluoroethylene, 90–91
fibrin sealant, hernia repairs, 92–93
polyester, 90
polypropylene, 90
synthetic non-absorbable polymers, 90
types, 90
R
Ramirez, O.M., 6, 55, 101, 114
Rectus muscle fascia
graft monitoring and immunosuppression, 151
graft retrieval, 150
interrupted sutures, multivisceral transplant, 151
preparation, 151
results, 152
storage and implantation, 150
timing, 150–151
Rectus sheath turnover, 119
Recurrent incisional hernias, 16, 18–19
Reid, R.R., 123, 130
Resuscitation, damage control, 96–97
Rodriguez, E.D., 102–104, 107
Rosen, M.J., 156, 163
Rotondo, M.F., 49, 95
S
Schwab, C.W., 95
Shoemaker, W.C, 97
Short-bowel syndrome (SBS)
abdominal wall defects, 187
bowel adaptation period, 191–192
clinical description, 185–186
glutamine, 193
growth hormone, 193
decocious valve preservation, 186–187
immediate postoperative period, 190–191
intestinal failure, 185
intestinal transplantation in patients, 195
kidney stones/gallstones formation, 186
long-term management period, 192–193
modified diet, 193
nutritional and metabolic management, 189–190
pathophysiology, 188–189
surgical considerations, 194–195
symptoms and signs, 186
TPN, 185
Skin-only closure, 62
Somatostatin-14, 200–201
Split-thickness skin graft (STSG), 137
Stoma city, 67, 68
Surgical zipper, 61–62
Synthetic non-absorbable polymers, 90
T
Tantalum, 6
Teixeira, P.G., 98
Temporary abdominal closure (TAC)
ABThera™, 60
Bogota bag, 61
considerations, 62
damage control, 98–100
poor-man’s VAC, 60–61
skin-only closure, 62
staged reconstructions, 85
surgical zipper, 61–62
vacuum-assisted closure, 60
Wittman Patch®, 61, 62
Tensor fascia latae (TFL) flap, 86–87
Teubner, A., 201
Thompson, J.S., 194, 195
Tilson, M.D., 12
Tissue expanders, 55–56, 163
Tissue transfer, abdominal wall defect management
abdominal wall reconstruction, 114
anterior rectus abdominis sheath turnover flap method, 116–117
blood supply, anterior rectus turnover flap, 118–121
Tissue transfer, abdominal wall defect management (cont.)
component separation method, 114–115
component separation method modifications, 116
degree of tissue advancement, 115–116
musculoskeletal and neurovascular anatomy, 114
surgical procedure, 117–118
temporary abdominal wall closure, 113

Total parenteral nutrition (TPN)
abdominal wall reconstruction, 143
enteroatmospheric fistulas, 66
GI fistulas, 200
intra-abdominal sepsis, 69
short-bowel syndrome, 185, 189–190, 193, 194
Towel clip closure, 50
Trace elements, 202

U
Ultrasonography, 31–32
Underlay mesh placement, ECFs

abdominal wall reconstruction, 139
interposition Strattice graft, 142
Usher, F.C., 6

V
Vacuum-assisted wound closure, 51, 60, 137
Ventilation, damage control, 97–98
Ventral hernia, 3, 5, 16, 113, 161
EAST definition, timing, 26
prevalence, 167
repair, 52, 53, 56, 75, 90, 102
Visschers, R.G., 133
Vogel, T.R., 98

W
Weinberg, J.A., 100
Wittman Patch®, 61, 62